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EXAMINER	
YI, STELLA KIM	

ART UNIT	PAPER NUMBER
1742	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/584,509	GRASSELLI ET AL.	
	Examiner	Art Unit	
	Stella Yi	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 January 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *36-64,66,67 and 71* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *36-64, 66-67, and 71* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 36-64, 66-67, and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over TIRELLI et al. (2003/0059613) in view of OTANI (JP 2000-106041), and in further view of BELLI et al. (WO 02/47092).

Regarding Claims 36 and 37, TIRELLI et al. discloses a process for manufacturing a self-extinguishing cable comprising at least one conductor (transmissive element) and at least one flame-retardant coating (4) that is in a position radially external to said at least one conductor (2) (see Figure 1), wherein said at least one coating comprises:

(i) providing a flame retardant coating comprising:

a) at least one expandable polymer made of at least one olefin [0019];

b) at least one inorganic hydrated flame-retardant filler [0020];

(ii) said at least one expandable polymer and the at least one flame-retardant inorganic filler are premixed in an internal mixer [0067];

(iii) feeding the flame-retardant polymeric material to an extruding apparatus [0069]; and

(iv) during the extrusion phase, the flame-retardant composition thus obtained can be used to coat the conductor directly, or to make an outer sheath on the conductor

which has been precoated with an insulating layer (depositing by extrusion the flame-retardant polymeric material obtained in step (iii) onto said at least one transmissive element conveyed to said extruding apparatus) [0071].

TIRELLI et al. teaches how to produce cables with a flame-retardant, halogen-free coating showing enhanced insulating properties [0016] but is silent to at least one expanding agent blended with 100 parts by weight of a flame-retardant filler. However, OTANI teach a method of producing a flexible non-halogen cable wherein a non-halogen flame-retarding sheath (coating) is used to cover the surfaces of insulated conductors (Abstract). A foaming agent (expanding agent) is blended non-halogen fire retardancy sheath (coating) and extruded [0007]. The fire retardant and foaming agents are blended with olefin system resin to produce the non-halogen fire retardancy sheath [0009]. 50-200 weight-section combination of such fire retardant is carried out to olefin system resin 100 weight section [0013]. The said foaming agent is for making olefin system resin which is base resin of non-halogen fire retardancy sheath foam, and the foaming agent is blended with olefin system resin, and it extrudes and covers with an extruder. With heat as it extrudes, the foaming agent acts and olefin system resin foams [0014]. Expansion ratio which blends this foaming agent with olefin system resin and to which olefin system resin is made to foam is 5 to 20% [0014]. The addition of the said foaming agent in the non-halogen flame-retarding sheath (coating) provides sufficient tensile strength so that tear nature can be improved, handling nature and workability can be raised, and fire retardancy made into a standard can be secured [0016]. Therefore, it would have been obvious to one of ordinary skill in the art at the

time of the invention to have modified the process for manufacturing a self-extinguishing cable comprising at least one conductor (transmissive element) and at least one flame-retardant coating of TIRELLI et al. to include the addition of the foaming agent (expanding agent) taught by OTANI for the benefits of producing a flexible non-halogen self-extinguishing cable with sufficient tensile strength for improved handling nature and workability as well as secure fire retardancy.

Modified TIRELLI et al. by OTANI is silent to passing the flame-retardant polymeric material through at least one static mixer prior to deposition by the said extruder. However, BELLI et al. teach a process for producing a cable with at least one coating layer of electrical insulation made of an expandable thermoplastic polymer material such as the one described in TIRELLI et al. The expandable polymer of BELLI et al. provides the insulating coating with good flexibility and high mechanical strength under both hot and cold conditions (Page 5, lines 27-30). BELLI et al. teach the process for coating the cable with such expandable polymer comprises extruding the polymer and passing it through a static mixer prior to depositing it onto a conductor (transmissive element) (Page 7, lines 4-9). BELLI et al. teach that the said static mixer is generally a blending device, which is known per se in the art, in which the blending action is obtained by forcing of the material to be blended past stationary blending elements. Said blending elements carry out numerous subdivisions and recombination of the flow, thus making it possible to obtain the desired uniformity of properties within the material leaving this mixer (Page 9, lines 33-37 through Page 10, lines 1-7). The flame-retardant polymeric material coating of modified TIRELLI et al. by OTANI requires

the expandable polymer, expanding agent, and flame-retardant to be uniformly mixed prior to deposition by the extruder. Therefore, it would have been obvious to one of ordinary skill in the art to have combined the teachings of TIRELLI et al. and OTANI with BELLI et al. for producing a coating layer that includes expandable polymer, expanding agent, and flame retardant inorganic filler substantially uniformly mixed throughout the thickness of said coating by a static mixer of BELLI et al. for the benefits of obtaining a highly reliable cable that is suitable for electrical power transmission and/or distribution (Page 7, lines 1-15).

Regarding Claims 38-40, TIRELLI et al. discloses the said at least one flame-retardant coating (4) has electrical insulation properties [0080] and is positioned radially external to said conductor (2) (see Figure 2).

Regarding Claim 41, TIRELLI et al. discloses the cable comprises at least two conductors (transmissive elements) and a filling material (5) which fills the interstitial zones between said at least two conductors, said filling material comprising said expanded flame-retardant polymeric material ([0083] and see Figure 3).

Regarding Claims 42-45, TIRELLI et al. discloses said expandable polymer in the flame-retardant coating of the self-extinguishing cable is selected from: polyethylene; copolymers of ethylene with at least one α-olefin containing from 3 to 12 carbon atoms, and optionally with at least one diene containing from 4 to 20 carbon atoms; polypropylene; thermoplastic copolymers of propylene with ethylene and/or at least one α-olefin containing from 4 to 12 carbon atoms; copolymers of ethylene with at least one ester selected from alkyl acrylates, alkyl methacrylates and vinyl carboxylates, wherein

the alkyl and the carboxylic groups comprised therein are linear or branced and wherein the linear or branched alkyl group may contain from 1 to 8, while the linear or branched carboxylic group may contain from 2 to 8 carbon atoms, or mixtures thereof [0022].

Regarding Claim 46, TIRELLI et al. teach said expandable polymer is selected from copolymers of ethylene with at least one C_4-C_{12} α-olefin, having a density of 0.86 to 0.90 g/cm3 and the following composition: 75-97 mol% of ethylene, 3-25 mol% of α-olefin, and 0-5 mol% of a diene [0050].

Regarding Claim 47, TIRELLI et al. is silent to the elastic flexural modulus of the said expandable polymer. However, BELLI et al. discloses a process for producing a cable with at least one coating layer of electrical insulation made of a thermoplastic polymer material such as the one described in TIRELLI et al. wherein the ethylene copolymers have the following monomer composition: 35-90 mol% of ethylene; 10-65 mol% of an α-olefin, and 0-10 mol% of a diene; 75-97 mol% of ethylene, 3-25 mol% of an α-olefin, and 0-5mol% of a diene (Page 15, lines 1-11). BELLI et al. teach said expandable polymer is selected from a propylene homopolymer or a copolymer of propylene with at least one olefinic comonomer chosen from ethylene and an α-olefin other than propylene, having an elastic flexural modulus generally of between 30 to 900 MPa (Page 12, lines 12-18). The expandable polymer of BELLI et al. provides the insulating coating with good flexibility and high mechanical strength under both hot and cold conditions (Page 5, lines 27-30). Therefore, it would have been obvious to one of ordinary skill in the art to have substituted the expandable polymer of BELLI et al. for

the expandable polymer of TIRELLI et al. in light of the advantages associated therewith.

Regarding Claim 48, TIRELLI et al. is silent to the characteristics of said expandable polymer. However, BELLI et al. teach a propylene homopolymer or a copolymer of propylene with at least one olefinic comonomer chosen from ethylene and an α-olefin other than propylene having:

a melting point of from 140 to 165C;

a heat of fusion of from 30 to 80 J/g;

a fraction which is soluble in boiling diethyl ether, in an amount of less than or equal to 12% by weight, having a heat of fusion of less than or equal to 4 J/g;

a fraction which is soluble in boiling n-heptane, in an amount of from 15 to 60% by weight, having a heat of fusion of 10 to 40 J/g; and

a fraction which is insoluble in boiling n-heptane, in an amount of 40 to 85% by weight, having a heat of fusion of greater than or equal to 45 J/g (Pages 12-13, lines 1-20).

Regarding Claims 49-52, TIRELLI et al. teaches how to produce cables with a flame-retardant, halogen-free coating showing enhanced insulating properties [0016] but is silent to at least one expanding agent. However, OTANI teach a method of producing a flexible non-halogen cable wherein a non-halogen flame-retarding sheath (coating) is used to cover the surfaces of insulated conductors (Abstract). A foaming agent (expanding agent) is blended with the non-halogen fire retardancy sheath (coating) and extruded [0007]. The fire retardant and foaming agents are blended with

olefin system resin to produce the non-halogen fire retardancy sheath [0009]. The said foaming agent is azobisisobutyronitrile, dinitro pentamethylene tetramine, or 4,4'-oxybis benzene sulfonylhydrazide [0016]. The addition of the said foaming agent in the non-halogen flame-retarding sheath (coating) provides sufficient tensile strength so that tear nature can be improved, handling nature and workability can be raised, and fire retardancy made into a standard can be secured [0016]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the process for manufacturing a self-extinguishing cable comprising at least one conductor (transmissive element) and at least one flame-retardant coating of TIRELLI et al. to include the addition of the foaming agent (expanding agent) taught by OTANI for the benefits of producing a flexible non-halogen self-extinguishing cable with sufficient tensile strength for improved handling nature and workability as well as secure fire retardancy.

Regarding Claims 53-54, OTANI teach 0.2-5 weight-section combination of such foaming agent (expanding agent) is carried out to olefin system resin 100 weight section [0015].

Regarding Claim 55, OTANI teach the said expanding agent is compounded as a masterbatch formed by mixing the expanding agent with an olefin-based polymer [0019].

Regarding Claim 56, OTANI teach the olefin-based polymer is ethylene/vinyl acetate copolymer [0011].

Regarding Claims 57-58, OTANI teach in Examples 1 through 7 wherein the masterbatch comprises an amount of expanding agent of 0.1% to 3% by weight with respect to the total weight of the olefin-based polymer.

Regarding Claims 59-61, OTANI teach the flame-retardant polymeric material comprises at least two or more expanding agents [0017]. OTANI is silent to the ratio of the said expanding agents. However, OTANI teach in Examples 1 through 7 of the various amounts of expanding agents being used in the masterbatch that results in good and/or bad tear property. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to conduct routine experimentation to determine the optimum expanding agent ratio for the masterbatch because OTANI teach that the amount of expanding agents can be varied to control the tear property in Examples 1 through 7. *"Discovery of optimum value of result effective variable in known process is ordinarily within skill of art." In re Boesc, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).* Also, it would have been obvious to one of ordinary skill in the art at the time of invention to have provided said expanding agents being present in a ratio of 0.5:3 for the masterbatch of OTANI, because applicant has not provided any evidence indicating that such ratio is critical or yields unexpected results; and therefore, selecting an expanding agent ratio of 0.5:3 for the masterbatch of OTANI would merely be a matter of engineering choice which would have been discoverable by routine experimentation. See MPEP 2144.05.

Regarding Claims 62-63, TIRELLI et al. teach said flame-retardant inorganic filler is selected from hydroxides, hydrated oxides, salts, hydrated salts of metals, magnesium, or calcium [0028].

Regarding Claim 64, TIRELLI et al. teach said flame-retardant filler is generally used in the form of particles which are untreated or surface treated with saturated or unsaturated fatty acids containing from about 8 to 24 carbon atoms, or metal salts thereof [0053].

Regarding Claim 66, TIRELLI et al. discloses at least one coupling agent is added to the flame-retardant polymeric material, said coupling agent being selected from short chain organic silanes with ethylenic unsaturation [0053] and [0061].

Regarding Claim 67, TIRELLI et al. teach said coupling agent is pre-grafted onto a polyolefin [0060].

Regarding Claim 71, OTANI discloses the said expansion ratio of the said flame retardant polymeric material is recommended at 5 to 20% but an expansion greater than 20% may be achieved [0014]

Response to Arguments

Applicant's arguments filed 01/07/2011 have been fully considered but they are not persuasive.

a) Applicant argues on page 12, while Otani teaches the broad ranges of 50-200 parts by weight filler and a degree of expansion of 20-50%, Otani does not teach or

suggest to a person of ordinary skill in the art that its disclosure applies to every combination of those ranges. In fact, Otani teaches away from the claimed invention.

Examiner respectfully disagrees. OTANI teach a method of producing a flexible non-halogen cable wherein a non-halogen flame-retarding sheath (coating) is used to cover the surfaces of insulated conductors (Abstract). Such halogen-free flame-retardant cable is needed by TIRELLI et al. [0016];[0079]. Furthermore, OTANI teach a foaming agent (expanding agent) is blended with non-halogen fire retardancy sheath (coating) and extruded [0007]. The fire retardant and foaming agents are blended with olefin system resin to produce the non-halogen fire retardancy sheath [0009]. 50-200 weight-section combination of such fire retardant is carried out to olefin system resin 100 weight section [0013]. The said foaming agent is for making olefin system resin which is base resin of non-halogen fire retardancy sheath foam, and the foaming agent is blended with olefin system resin, and it extrudes and covers with an extruder. With heat as it extrudes, the foaming agent acts and olefin system resin foams [0014]. Expansion ratio which blends this foaming agent with olefin system resin and to which olefin system resin is made to foam is 5 to 20% [0014]. When the expansion ratio is less than 5%, it will tear and when it is above 20% it tears with loss in predetermined physical characteristic [0014]. Although OTANI teaches a degree of expansion of 7-15% is ideal, as shown in embodiments 3, 6, and 7 as argued by the Applicant. OTANI does not exclude teaching of the degree of expansion above 15%. OTANI teaches in embodiments 2 and 5 that a degree of expansion of 20% and 18% respectively, is obtained with the filler amount being 50-200 parts by weight. The addition of the said

foaming agent in the non-halogen flame-retarding sheath (coating) provides sufficient tensile strength so that tear nature can be improved, handling nature and workability can be raised, and fire retardancy made into a standard can be secured [0016]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the process for manufacturing a self-extinguishing cable comprising at least one conductor (transmissive element) and at least one flame-retardant coating of TIRELLI et al. to include the addition of the foaming agent (expanding agent) taught by OTANI for the benefits of producing a flexible non-halogen self-extinguishing cable with sufficient tensile strength for improved handling nature and workability as well as secure fire retardancy.

b) Applicant argues that there is no basis to combine Tirelli with Otani and have a reasonable expectation of success and that the Office has not shown that a person skilled in the art would believe that the cable of Tirelli would be improved in the manner suggested.

Examiner respectfully disagrees. OTANI teach a method of producing a flexible non-halogen cable wherein a non-halogen flame-retarding sheath (coating) is used to cover the surfaces of insulated conductors (Abstract). Such halogen-free flame-retardant cable is needed by TIRELLI et al. [0016];[0079]. OTANI teach that the addition of the said foaming agent in the non-halogen flame-retarding sheath (coating) wherein 50-200 parts by weight of such fire retardant is carried out to olefin system resin 100 weight section [0013], provides sufficient tensile strength so that tear nature can be improved, handling nature and workability can be raised, and fire retardancy

made into a standard can be secured [0016]. Such fire retardant improved halogen free cable of OTANI is also needed in TIRELLI et al. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the process for manufacturing a self-extinguishing cable comprising at least one conductor (transmissive element) and at least one flame-retardant coating of TIRELLI et al. to include the addition of the foaming agent (expanding agent) taught by OTANI for the benefits of producing a flexible non-halogen self-extinguishing cable with sufficient tensile strength for improved handling nature and workability as well as secure fire retardancy.

c) Applicant argues that Otani teaches that if a large amount of filler is used, tensile strength decreases as the foaming rate increases. Thus, adding a foaming agent to the composition of Tirelli, which much use an adequate amount of flame-retardant filler "to obtain a cable which is capable of passing flame/fire-propagation tests" [0054] would seem to offer no benefits and instead would worsen the cable's mechanical properties.

Examiner respectfully disagrees. OTANI teach the benefits of filler amount being 50-200 parts by weight and that exceeding 200 parts by weight is not recommended since abrasion resistance to a mechanical shock would decrease [0013]. TIRELLI teach that the flame-retardant filler be added in a predetermined amount so as to obtain a cable which is capable of passing the flame test [0054]. OTANI teach that the said amount of the flame-retardant filler not only improves the tensile strength for improved handling nature and workability but it also secures fire retardancy [0016]. Therefore, the

amount of the flame-retardant filler of OTANI would pass the flame test of TIRELLI and would also help improve the tensile strength for the cable of TIRELLI. Therefore, adding the foaming agent of OTANI to the composition of TIRELLI would offer the benefits of improved tensile strength and flame-retardancy thus improving the mechanical properties of TIRELLI's cable.

d) Applicant argues that one of ordinary skill in the art would have no reason to apply Belli's static mixer with the combined processes of Tirelli or Otani because Belli's teachings with respect to the static mixer relate to a different composition with different physical properties.

Examiner respectfully disagrees. BELLI et al. teach a process for producing a cable with at least one coating layer of electrical insulation made of an expandable thermoplastic polymer material such as the one described in TIRELLI et al. The process of BELLI et al. requires at least one thermoplastic polymer and such process that requires coating the cable with such expandable polymer by extruding the polymer and passing it through a static mixer prior to depositing it onto a conductor (transmissive element) (Page 7, lines 4-9), helps obtain the benefits of a highly reliable cable that is suitable for electrical power transmission and/or distribution (Page 7, lines 1-15). Furthermore, the said static mixer of BELLI et al. is generally a blending device, which is known per se in the art, in which the blending action is obtained by forcing of the material to be blended past stationary blending elements. Said blending elements carry out numerous subdivisions and recombination of the flow, thus making it possible to obtain the desired uniformity of properties within the material leaving this mixer (Page 9,

lines 33-37 through Page 10, lines 1-7). The said static mixer is not limited to just a mixture comprising a dielectric liquid. As commonly known in the art, the static mixer is used for various mixtures to uniformly blend a mixture comprising various fillers, polymers, and/or ingredients. The flame-retardant polymeric material coating of modified TIRELLI et al. by OTANI requires the expandable polymer, expanding agent, and flame-retardant to be uniformly mixed prior to deposition by the extruder. Therefore, it would have been obvious to one of ordinary skill in the art to have combined the teachings of TIRELLI et al. and OTANI with BELLI et al. for producing a coating layer that includes expandable polymer, expanding agent, and flame retardant inorganic filler substantially uniformly mixed throughout the thickness of said coating by a static mixer of BELLI et al. for the benefits of obtaining a highly reliable cable that is suitable for electrical power transmission and/or distribution (Page 7, lines 1-15).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stella Yi whose telephone number is 571-270-5123. The examiner can normally be reached on Monday - Thursday from 8:00 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SY

/Jeff Wollschlager/
Primary Examiner, Art Unit 1742